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IS 4185 (1989): Adhesive Paper Tapes [PCD 12: Plastics]



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*Indian Standard*  
**ADHESIVE PAPER TAPES —  
SPECIFICATION**  
( *First Revision* )

भारतीय मानक  
आसंजक कागज टेप — विशिष्ट  
( पहला पुनरीक्षण )

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## FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards on 4 December 1989, after the draft finalized by the Adhesives Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Adhesive paper tapes are manufactured by coating uniformly on one side of the paper with a water soluble adhesive composition. These are used for sealing corrugated and solid fibreboard containers, paper boxes, paper cartons and small packages.

This standard was first issued in 1967 and this revision is intended to improve and bring it up-to-date with the current practices for gummed tapes. In this revision, requirement of tensile strength has been included. Tolerance limits have been specified on the length and width of tape and method of determination of burst factor has been clarified.

Considerable assistance has been derived from BS 1133 Section 14 : 1985 'Adhesive closing and sealing tapes', issued by the British Standards Institution.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

# Indian Standard

## ADHESIVE PAPER TAPES — SPECIFICATION

( *First Revision* )

### 1 SCOPE

**1.1** This standard prescribes the requirements and the methods of sampling and test for adhesive paper tapes. These tapes are moistened with water prior to application.

### 2 REFERENCES

**2.1** The following Indian Standards are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
IS 1060 ( Part 1 ) : 1966	Methods of sampling and test for paper and allied products : Part 1 ( <i>revised</i> )
IS 1397 : 1967	Kraft paper ( <i>first revision</i> )
IS 1398 : 1982	Packing paper, waterproof, bitumen laminated ( <i>second revision</i> )
IS 2508 : 1984	Low density polyethylene film ( <i>second revision</i> )

### 3 REQUIREMENTS

#### 3.1 Description

The tape consists of a hard-sized kraft paper coated uniformly on one side with an adhesive.

#### 3.2 Materials

##### 3.2.1 Base Paper

The base paper shall consist of kraft paper ( bleached or unbleached ), hard-sized to resist adhesive penetration and flexible to ensure folding and conformity with the shape of the package. The base paper shall also conform to Grade 2 of IS 1397 : 1967. The tensile strength of the gummed paper tape should be in accordance with Table 1 when tested by the method described in 12.3 of IS 1060 ( Part 1 ) : 1966.

##### 3.2.2 Adhesive

The adhesive shall be homogeneous and free from solid particles so as to give a smooth finish on application to the base paper. It shall emit no objectionable odour in either the dry or wet state, shall readily adhere to the base paper and be quickly activated with water. The adhesive shall not contain any material which is known to be toxic. It should be specially formulated to give fast tack and strong bonding.

#### 3.3 Dimensional Requirements

**3.3.1** Gummed paper tapes are available in a wide range of widths and strengths and a tape should be chosen according to the size and mass of the package to be sealed. Table 1 gives a rough guide to this selection and indicates also the mass per unit area of adhesive coating appropriate to the particular type of package and tape.

**3.3.2** The tape shall be evenly and firmly wound on a cylindrical core having an inside diameter of not less than 12 mm and outside diameter not more than 30 mm. The cylindrical core shall be rigid enough not to collapse under ordinary conditions of transportation and usage. On unwinding a roll of a gummed tape, adjacent layers shall show no signs of adhering to each other. The gummed side of the tape shall face the core unless specified otherwise by the purchaser. The edges of the roll shall be neatly cut and the tape on each roll shall be one continuous strip or shall be suitably joined at not more than four places. The distance between any two consecutive joints shall be not less than 3 m.

**3.3.3** Unless specified otherwise by the purchaser, the tape shall be supplied in nominal width of 10, 20, 25, 40, 50, 60, 75, or 100 mm and length of 100 or 200 metres. A tolerance of  $\pm 1$  mm shall be allowed on the nominal width of tapes 25 mm or less and  $\pm 1.5$  mm on tapes more than 25 mm in nominal width. A tolerance of  $\pm 2$  percent shall be allowed on the nominal length of the tape.

**3.3.4** The length of the tape on each roll shall be calculated from the total weight of the roll ( without core ) and the mean weight of two specimens, each 2 m long, taken at random from the roll.

**Table 1 Typical Examples of Uses of Gummed Paper Tape**  
( *Clause 3.3.1* )

Type of Package	Minimum Machine Direction Tensile Strength N per 10 mm. Width	Minimum Mass per Unit Area of Coating of Adhesive g/m <sup>2</sup>	Minimum Tape Width mm
Large heavy wrapped bales	95	14	72
Fibreboard cases	55	11	48
Paper boxes and cartons	55	11	48
Small packages	45	11	24

### 3.4 Adhesion Performance

When tested in accordance with Annex A, the adhesive properties of the tape shall satisfy the requirements given in 3.4.1 to 3.4.3.

**3.4.1** The adhesive tape on being lifted away from the corrugated board after the 5-second period of adhesion, shall show a pronounced tackiness.

**3.4.2** When the adhesive tape is separated from the board after the 50-second period of adhesion, some of the fibres of the board shall adhere to the tape.

**3.4.3** It shall be impossible to separate the adhesive tape from the board after 2-hour period of adhesion, without damaging either the tape or the board.

### 3.5 Burst Factor

The adhesive paper tape shall have burst factor not less than 20 when tested according to 12.5 of IS 1060 ( Part 1 ) : 1966. The substance of the paper of tape shall be taken along with its gum content while calculating burst factor of the adhesive tape.

## 4 APPLICATION, USE AND STORAGE

**4.1** The gummed paper tapes may be either moistened manually or with the help of efficient moistening automatic machines. The method of applying gummed paper tape and the amounts required for the securing of fibre board cases and cartons is shown in Fig. 1 ( 'U' Seal ) and Fig. 2 ( 'H' Seal ) which emphasize the small quantity necessary for sealing. Any excess sealing such as passing the tape around the case may not serve any useful purpose.

**4.2** Gummed paper tapes should be kept in the original waterproof wrappers until required

for use and should be stored in a warm dry place away from moisture.

## 5 PACKING AND MARKING

### 5.1 Packing

Unless specified otherwise, the gummed paper tape rolls shall be packed in polyethylene film ( *see* IS 2508 : 1984 ) or in bitumen waterproof paper ( *see* IS 1398 : 1982 ). These rolls shall be packed in suitable containers so that they are adequately protected from damage in transportation and from deterioration due to climatic conditions.

### 5.2 Marking

Each roll and container shall be marked legibly with the following information:

- Name of the material;
- Indication of the source of manufacture;
- Length and width of the gummed paper tape;
- Month and year of manufacture;
- Number of rolls in containers;
- Batch of manufacture, when required; and
- Directions for storage and use, if necessary.

## 6 SAMPLING

### 6.1 Lot

The number of rolls of gummed paper tapes, of the same width and delivered to one buyer against one despatch note, shall constitute the lot.

**6.2** The conformity of the lot to the requirements of this standard shall be determined on the basis of tests carried out on the samples selected from the lot.

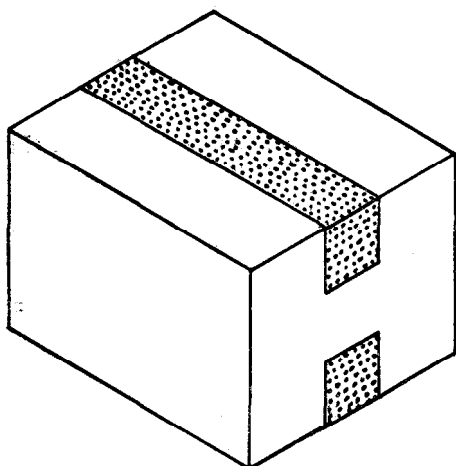


FIG. 1 'U' SEAL

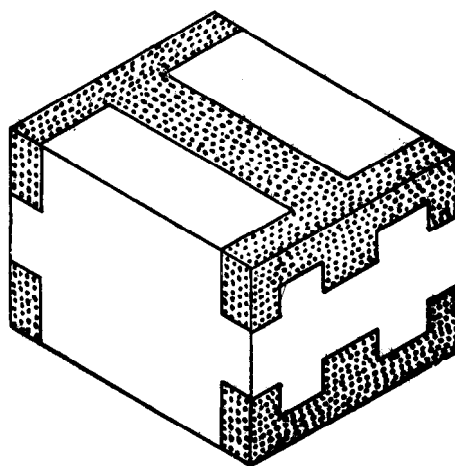


FIG. 2 'H' SEAL

**6.3** Unless agreed to otherwise between the purchaser and the supplier the number of rolls to be selected from the lot shall be in accordance with col 2 of Table 2. The rolls shall be selected from at least 10 percent of the containers. An equal number of rolls, as far as possible, shall be drawn from each container.

shall constitute the sample. These rolls shall be selected at random from those selected as in col 2 of Table 2. Two test specimens shall be taken from each of the rolls in the sub-sample as given in 6.5.1.

**6.5.1** Remove any damaged layer of gummed

**Table 2 Sample Size and Criteria for Conformity**

No. of Rolls in the Lot	No. of Rolls to be Selected	Permissible No. of Defective Rolls	Sub-Sample Size
(1)	(2)	(3)	(4)
Up to 150	8	0	2
151 „ 300	13	1	3
301 „ 500	20	2	4
501 „ 1 000	32	3	5
1 001 „ 3 000	50	5	6
3 001 „ 10 000	80	7	7
10 001 and above	125	10	8

**6.3.1** The selection of containers, as well as the selection of rolls, shall be done at random. For this purpose, random number tables shall be used. In case such tables are not available, the following procedure shall be adopted:

Starting from any container or roll, count them as 1, 2, 3,.....up to  $r$  and so on in one order,  $r$  being the integral part of  $N/n$  where  $N$  is the number of containers in the lot or the number of rolls in the container and  $n$  the number of containers or rolls to be selected. Every  $r$ th container or roll thus counted shall be withdrawn to constitute the sample.

**6.4** For visual and dimensional characteristics, the rolls selected as in col 2 of Table 2 shall constitute the test sample.

**6.5** For adhesion performance and burst factor, the number of rolls specified in col 4 of Table 2

tape from the outside of the rolls; then discard, in all cases, at least three undamaged layers. Cut a length of undamaged gummed tape long enough to carry out the tests for adhesion performance and burst factor on two specimens each, taken from it.

## 6.6 Criteria for Conformity

The lot shall be considered to be in conformity with the requirements of this standard if the following conditions are satisfied:

- The number of rolls found defective in respect of any one or more characteristics mentioned in 3.2 and 3.3 does not exceed the corresponding number given in col 3 of Table 2; and
- Each of the two test specimens ( see 6.5 ) tested for adhesion performance and burst factor satisfies the relevant requirements.

## ANNEX A

### ( Clause 3.4 )

## TEST FOR ADHESIVE PERFORMANCE

### A-1 APPARATUS

#### A-1.1 Corrugated Board

Any piece of dust-free corrugated board of suitable size.

#### A-1.2 Dispenser, brush-type.

### A-2 TEST SPECIMENS

**A-2.1** Cut two test specimens at least 20 cm long from each roll ( 6.5 ).

### A-3 PROCEDURE

**A-3.1** Moisten the gummed side of the specimen with water at a temperature of  $27^{\circ} \pm 2^{\circ}\text{C}$  with the dispenser and within 5 seconds press it down firmly on the corrugated board at right angles to the corrugation. After 5 seconds of

adhesion gently lift one end of the specimen and note the degree of tackiness. After 50 seconds of adhesion, lift another end of the specimen and examine whether some fibres of the board adhere to the tape. After 2 hours of adhesion try to separate the specimen from the board and record whether the separation is possible without causing damage to the gummed tape or the board.

**A-3.2** Carry out the same procedure with the other specimen but apply the specimen parallel to the corrugation of the board.

### A-4 REPORT

**A-4.1** Report the adhesion performance of each test unit in both directions of corrugated board after 5 seconds, after 50 seconds and after 2 hours.



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